

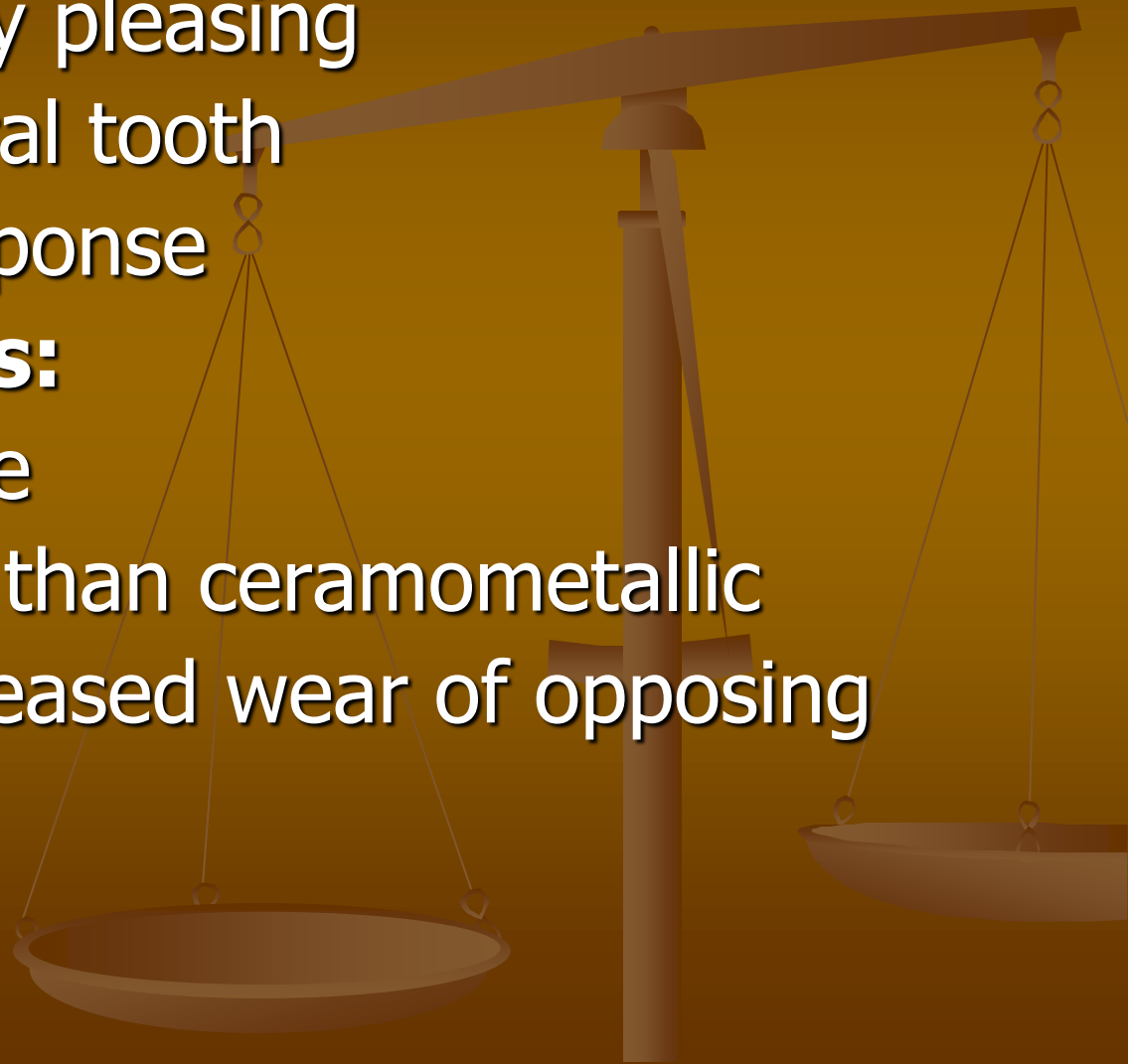
ALL CERAMIC RESTORATIONS



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Advantages

- Most esthetically pleasing
- Looks like natural tooth
- Good tissue response
- **Disadvantages:**
- Not conservative
- Strength is less than ceramometallic
- Sometimes increased wear of opposing arch

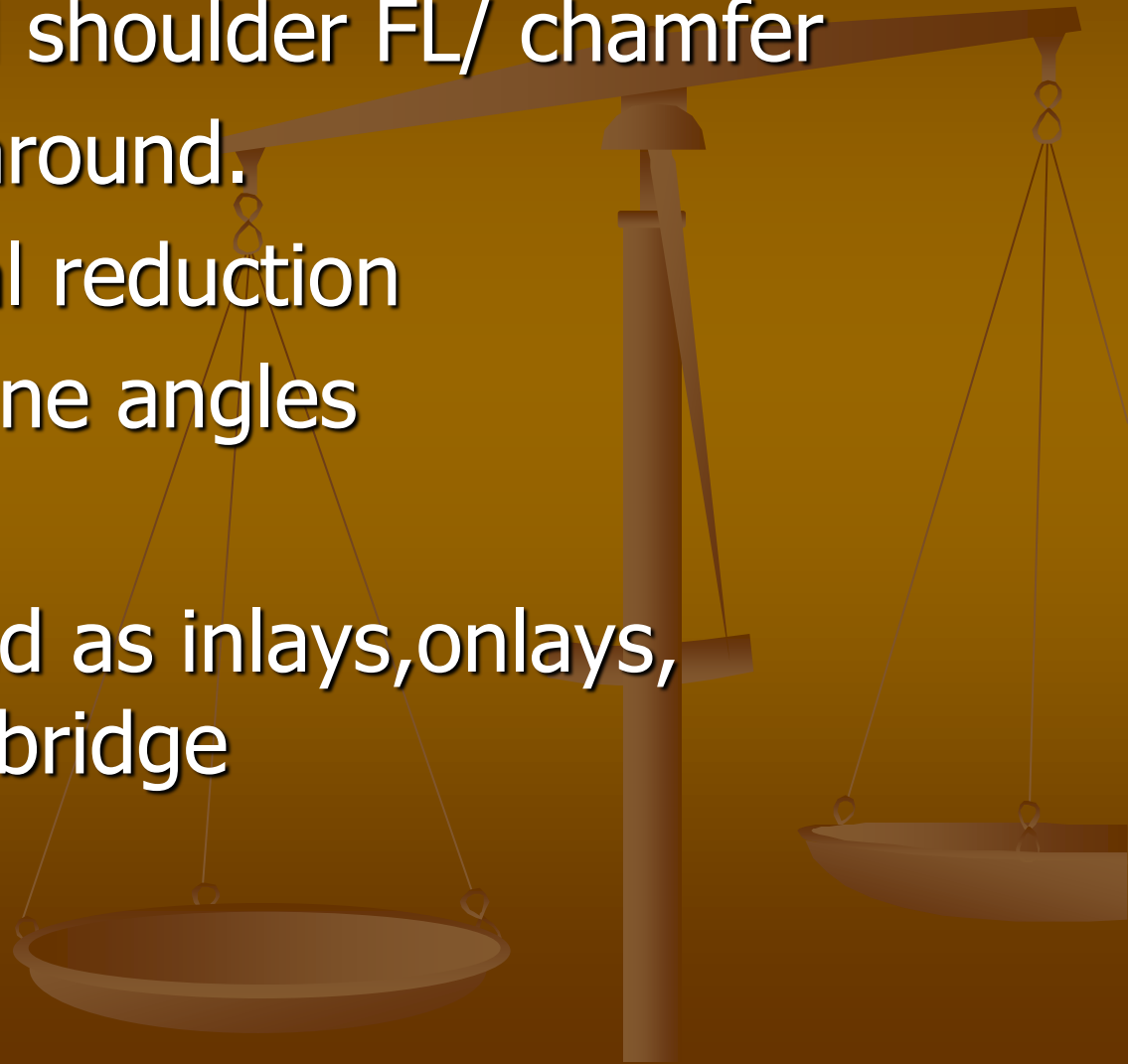


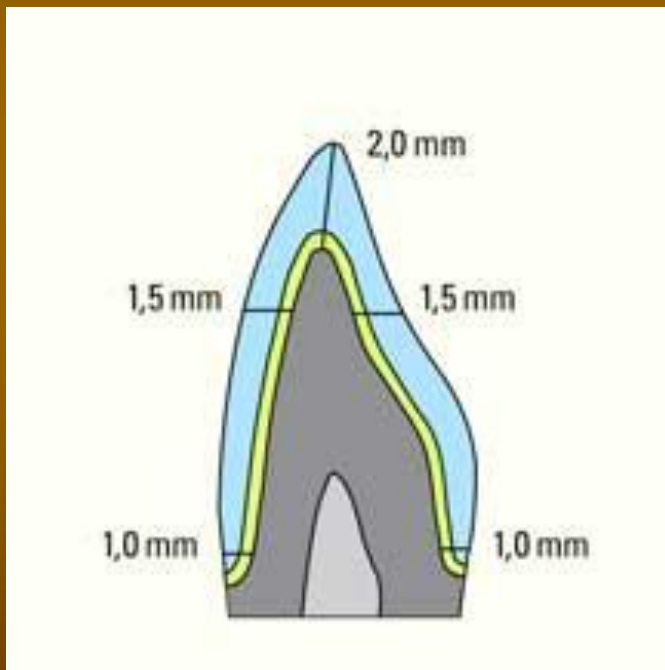
- Indication:
- Where maximum esthetics are required
- Sufficient tooth structure
- Favourable occlusion
- Contraindication:
- Where more conservative restoration is available
- Unfavourable occlusion or inability to prepare a 1mm shoulder FL all around



Preparation of crown

- Shoulder/ radial shoulder FL/ chamfer
- 1 mm thick all around.
- 1.5-2 mm incisal reduction
- Roundation of line angles
- Can also be used as inlays, onlays, veneers, 3 unit bridge

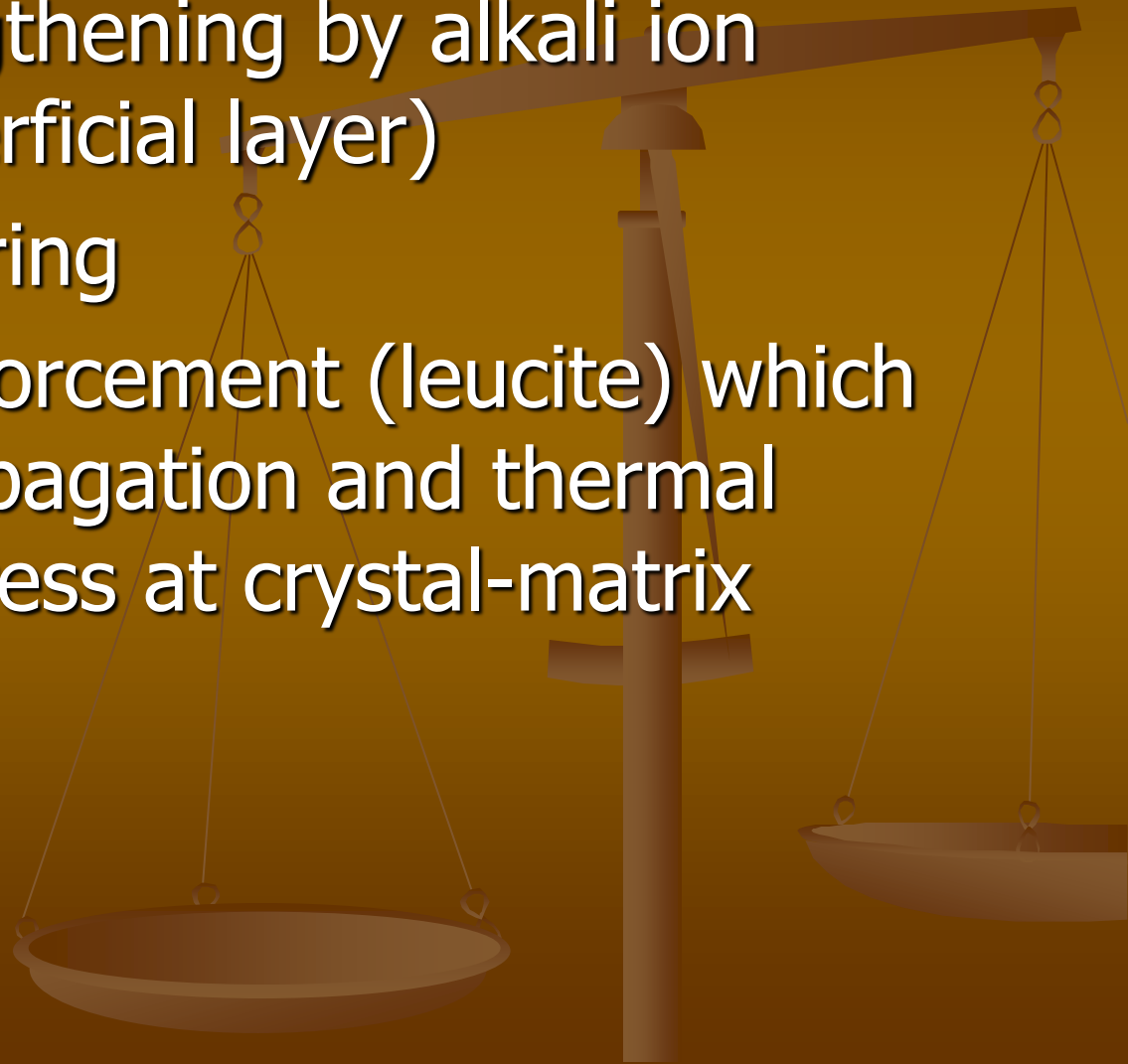






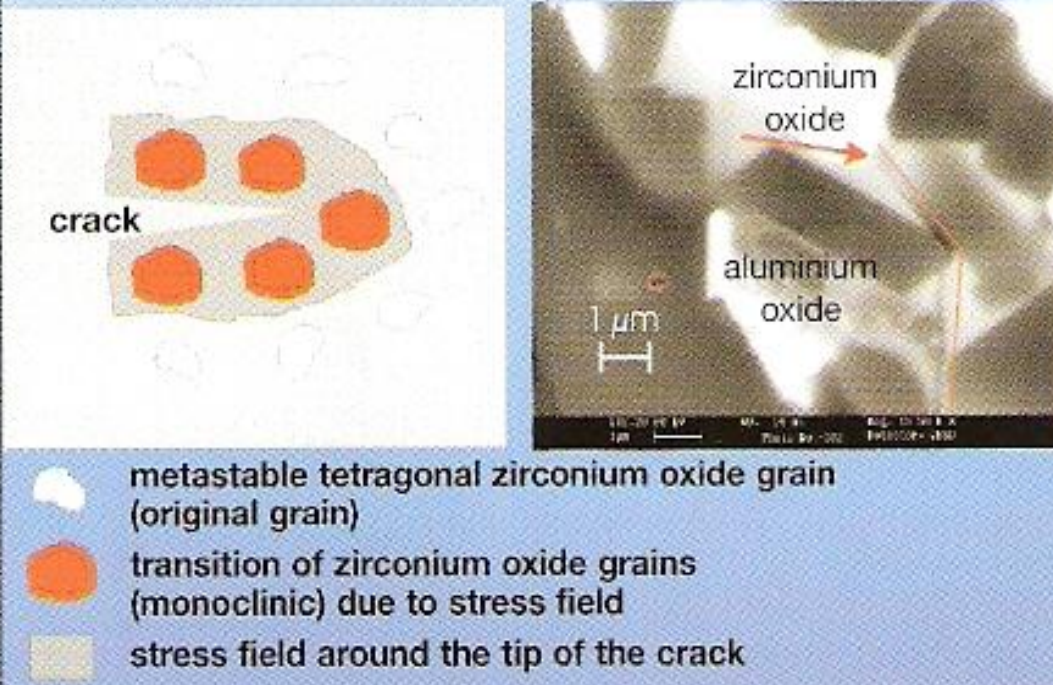
Strengthening of ceramics

- Chemical strengthening by alkali ion exchange (superficial layer)
- Thermal tempering
- Crystalline reinforcement (leucite) which stops crack propagation and thermal compression stress at crystal-matrix interface
- Glazing



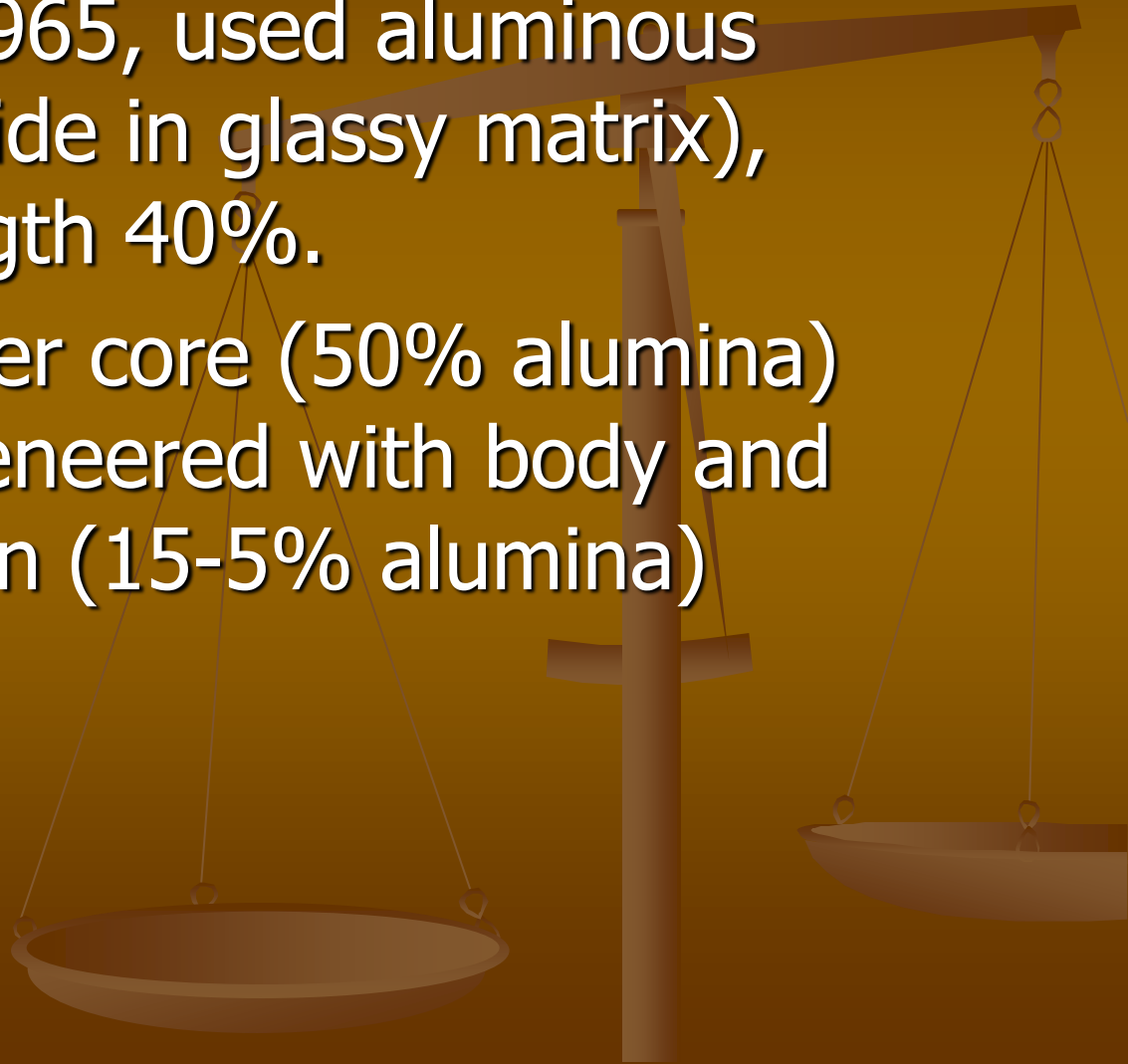
Prevention of cracks

The crack is limited by a zirconium oxide grain



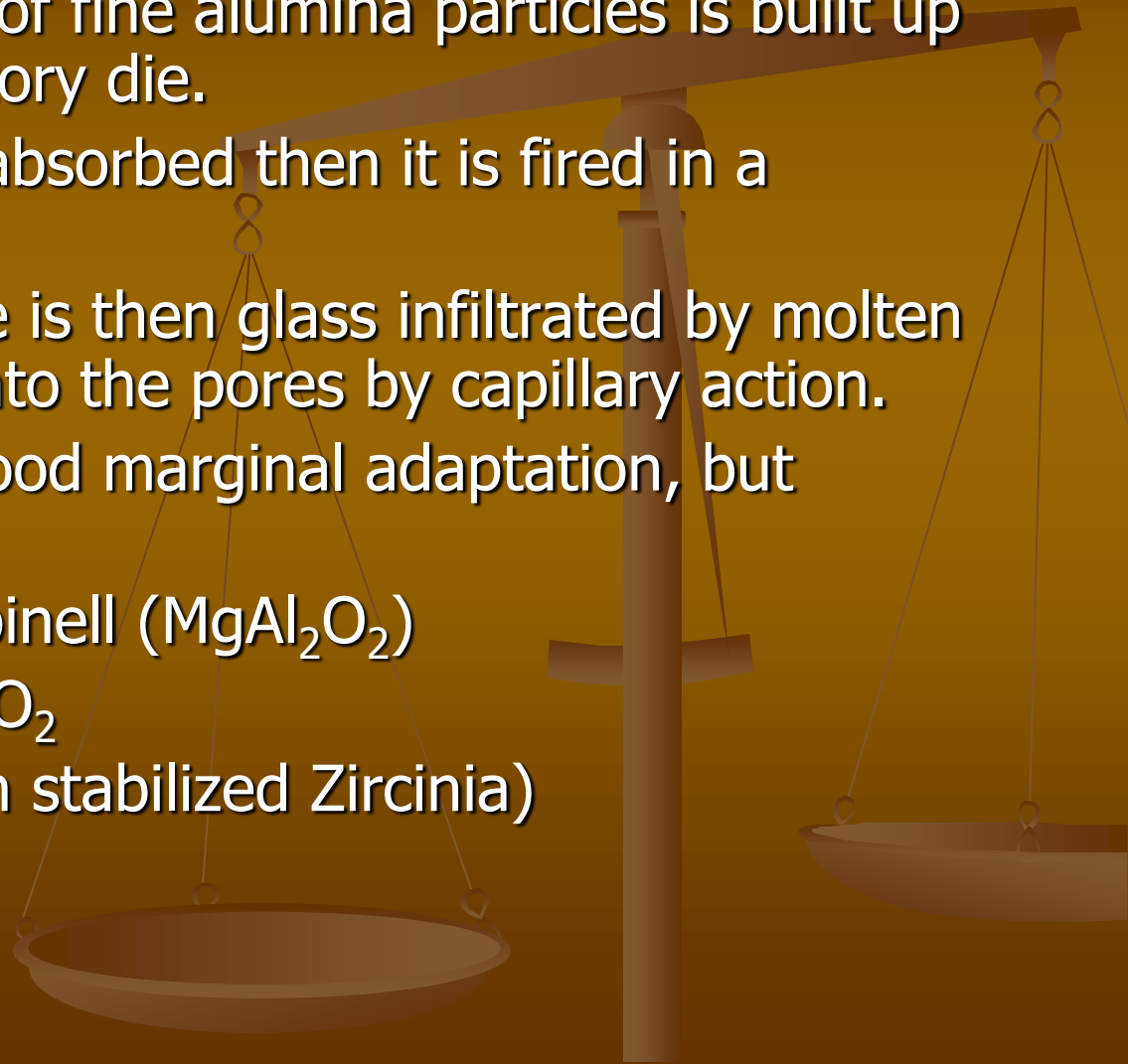
Aluminous core ceramics

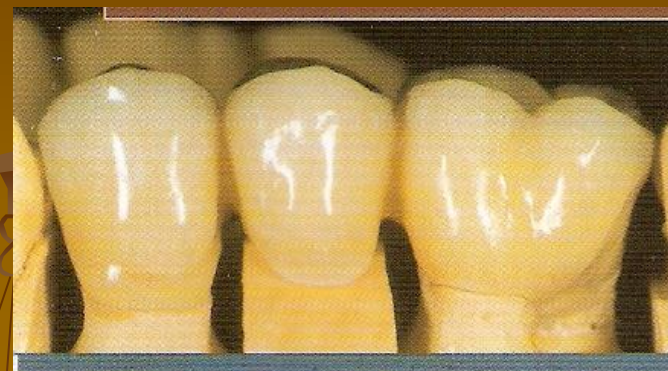
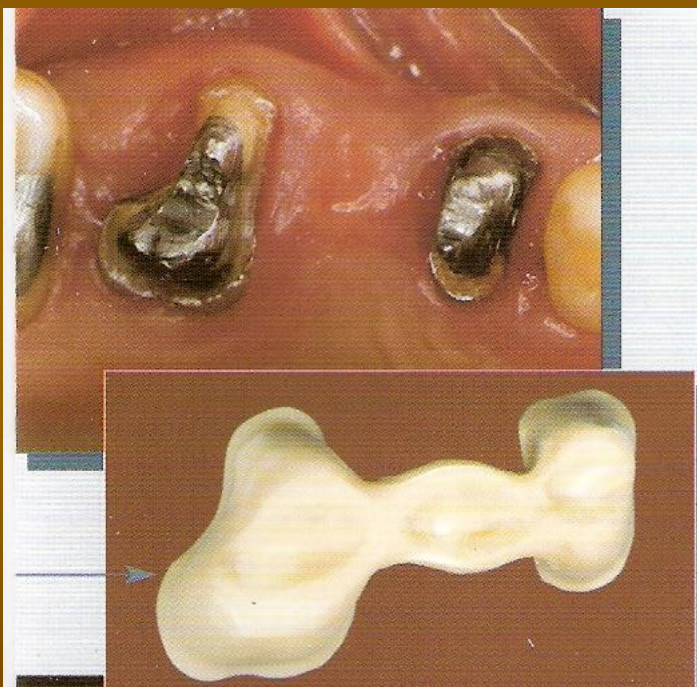
- Introduced in 1965, used aluminous porcelain (Al oxide in glassy matrix), increased strength 40%.
- Has opaque inner core (50% alumina) which is then veneered with body and enamel porcelain (15-5% alumina)



Slip cast ceramics (In-Ceram)

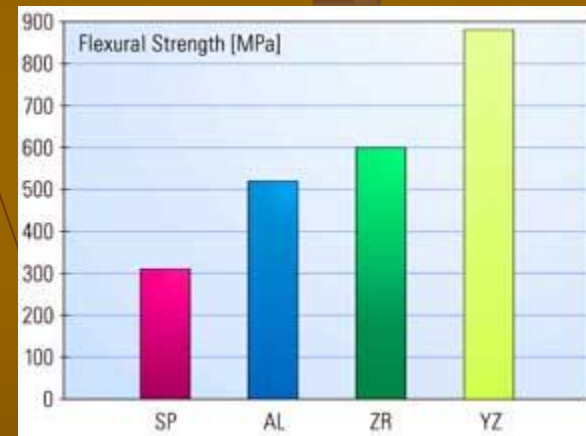
- Aqueous suspension of fine alumina particles is built up onto a special refractory die.
- The excess water is absorbed then it is fired in a furnace.
- The fired porous core is then glass infiltrated by molten glass that is drawn into the pores by capillary action.
- Has high strength, good marginal adaptation, but technique sensitive.
- Can use In-Ceram Spinell (MgAl_2O_2)
- In-Ceram Zirconia ZrO_2
- In-Ceram YZ (Yttrium stabilized Zirconia)



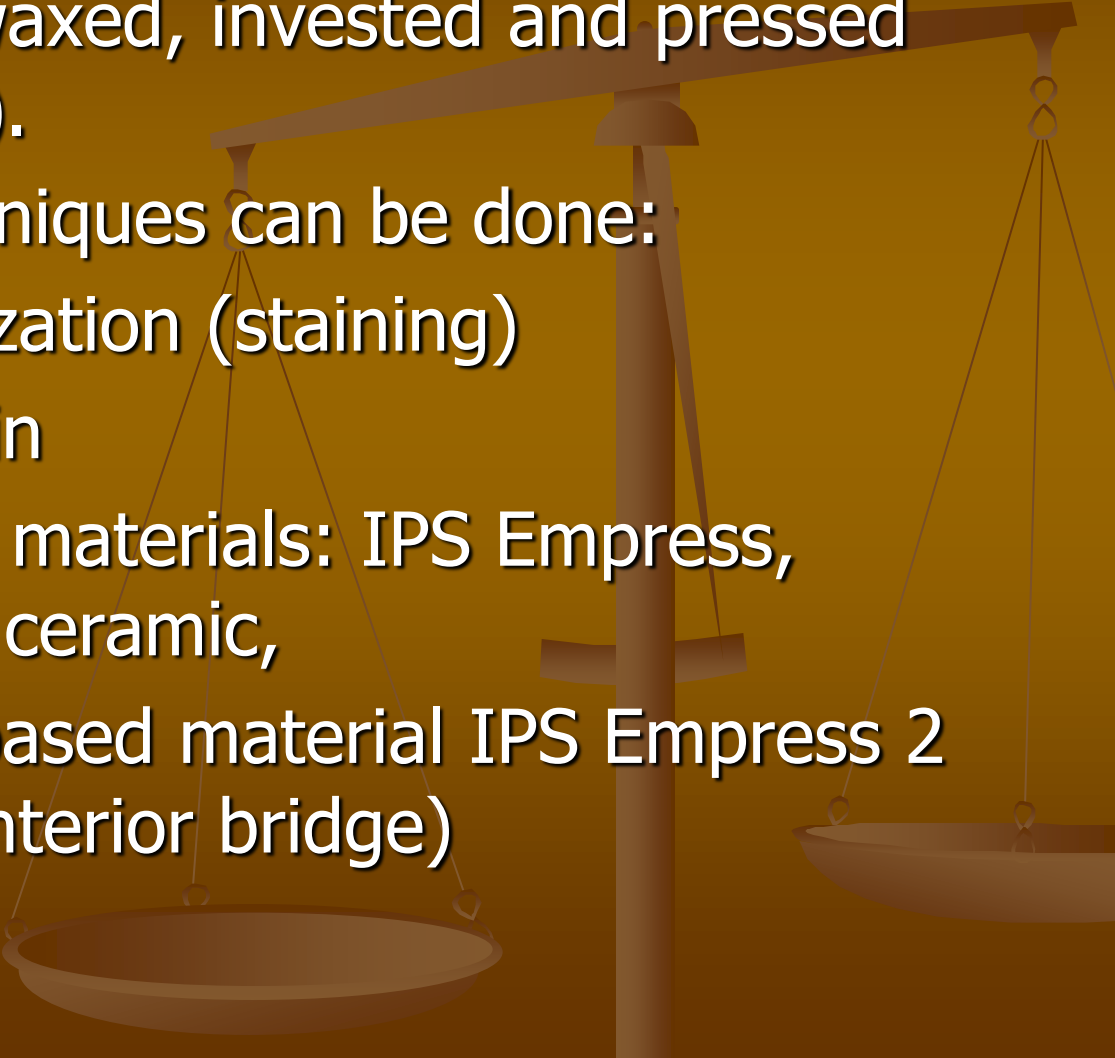




In Ceram YZ



Hot pressed ceramics

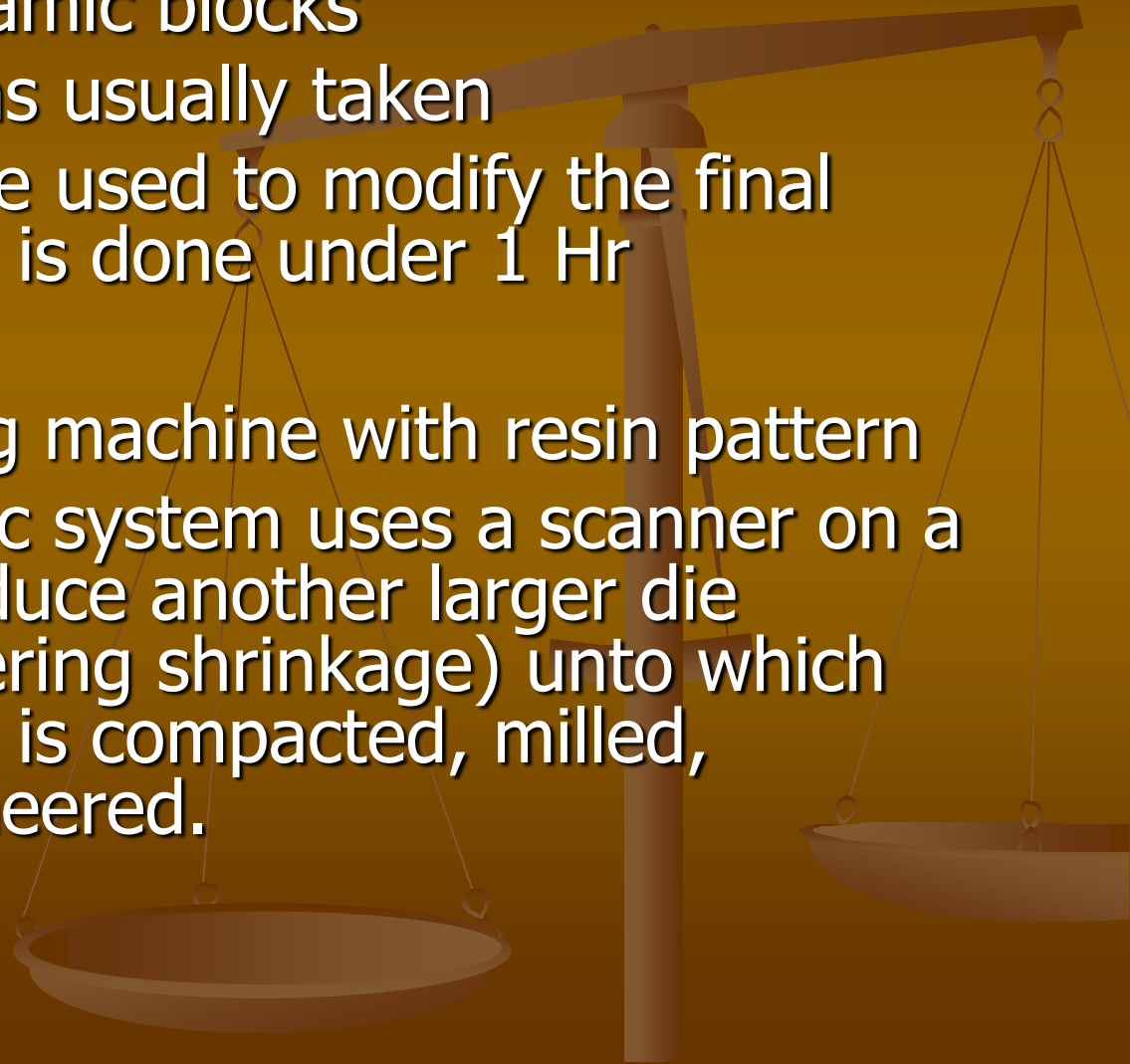
- Restorations are waxed, invested and pressed (similar to casting).
 - Two finishing techniques can be done:
 - Surface characterization (staining)
 - Veneering porcelain
 - Leucite containing materials: IPS Empress, Optimal pressable ceramic,
 - Lithium disilicate based material IPS Empress 2 (can be used as anterior bridge)
- 

IPS e.max ceram



Machined Ceramics

- CAD/CAM use ceramic blocks
- Optical impressions usually taken
- Computer software used to modify the final restoration, which is done under 1 Hr
- Cerec system
- Celay: copy milling machine with resin pattern
- Procera All ceramic system uses a scanner on a master die to produce another larger die (compensate sintering shrinkage) unto which aluminum powder is compacted, milled, sintered, then veneered.



Macinable Blocks



Procera Crown



Procera Bridge



Laminates



Single crowns

